

Incidence Risk Patterns of Intramammary Infection Pathogens during the Dry Period in Holstein Dairy Cattle

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Introduction

Intramammary infections acquired during the dry period are difficult to diagnosis and tend to lead to decreased production in the subsequent lactation. In addition, the use of dry cow therapies have virtually eliminated major pathogens, such as *Streptococcus agalactiae*. However, use of dry cow therapy or teat sealants may have questionable efficacy against other pathogens. Selective dry cow therapy, based on farm- or cow-specific pathogen profiles, tend to decrease usage of antimicrobial products. However, to generate farm-specific pathogen profiles, knowledge of incidence of intramammary pathogens is needed. The objective of this observational study is to determine the incidence of intramammary pathogens in dairy cattle across the dry period.

Materials and Methods

Ninety-three dairy farms in Canada were enrolled in this study. Four geographic regions (Western, Ontario, Quebec, and Atlantic) were identified as study centers, with the Western region contributing 19 farms, Ontario contributing 27 farms, Quebec contributing 29 farms, and Atlantic Canada contributing 18 farms.

Fifteen Holstein dairy cows were identified from each farm and enrolled. Composite and quarter milk samples were aseptically collected 14-30 days prior to expected dry off date (DC-1), 0-14 days prior to expected dry off date (DC-2), 24-48 hours after time of parturition (FC-1) and 7-14 days after parturition (FC-2). Pre-dry off (DC-1 and DC-2) samples were taken in a manner to ensure at least a 14-day time differential.

All milk samples were cultured for bacteriological analysis. In addition, somatic cell counts were performed per NMC recommendations. The risk of cure and the risk of new intramammary infection were calculated on a quarter basis.

Results

Nationwide, the most prevalent pathogens across the dry period were coagulase-negative *Staphylococcus* spp (CNS), *S. aureus* (SAU), *C. bovis* (CBS), *Streptococcus* spp. (STS), and other Gram positive (OGP). Risks of

cure and new IMI of CNS were 71% and 24.2% respectively. Risks of cure and new IMI of SAU were 78.2% and 2%, respectively. Risks of cure and new IMI of STS were 91.5% and 4.7%, respectively. Risks of cure and new IMI of CBS were 93.7% and 2.6%, respectively. Risks of cure and new IMI of OGP were 82% and 13.3%, respectively.

Significance

The risk of cure and risk of new IMI from these specific pathogens only represent the most prevalent pathogens. Other pathogens have been identified, with some being more prevalent on a farm-specific basis; however, they are not addressed here.

This study encompasses results of the 2007 calendar year. The same protocol has been implemented on 15 additional cows entering the dry period on the same farms for the 2008 calendar year. At the time of this incidence analysis, a more-refined definition of intramammary infection is a work-in-progress. Our definitions of cure and new IMI are made solely on the basis of bacteriological culture results. Use of SCC data will soon be included to refine the definitions of new IMI occurring over the dry period.

Additionally, analysis of bulk tank samples taken from these farms and data acquired from a specific questionnaire regarding dry cow nutrition, housing, use of antimicrobial therapies and teat sealants, and other management factors will hopefully be used to compile farm-specific pathogen profiles with the end result of providing an economical analysis to each farm to provide specific costs and benefits of usage of dry cow antimicrobial therapies and ancillary therapies, such as teat sealants.

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